

Claims:

1. A method of extracting toner from toner cartridges, said method including the steps of:
 - breaking up toner cartridges into pieces to release toner from within the
 - 5 cartridges;
 - passing the cartridge pieces over a sifting barrier so that only particles under a predetermined size pass through the barrier;
 - agitating the pieces to mobilise the toner;
 - extracting air from adjacent the pieces to remove airborne particles; and
 - 10 removing toner from the air extracted from adjacent the pieces.
2. A method according to claim 1 including the further step recovering the toner for recycling.
3. A method according to claim 1 or claim 2 including the further step of introducing ionised air adjacent the pieces.
- 15 4. A method according to any one of the proceeding claims whereby agitating the pieces involves repeatedly lifting and dropping the pieces.
5. A method according to any one of the proceeding claims whereby a trommel is used to agitate the pieces.
6. A method according to claim 5 whereby the trommel includes an inner drum
- 20 adapted to rotate about its longitudinal axis and an outer cover, the inner drum having a plurality of apertures and functioning as a separation screen so that only particles under a predetermined size pass through the screen and into the outer cover.
7. A method according to claim 6 whereby air is extracted from within the outer cover to encourage particles under a predetermined size to pass through the apertures in
- 25 the inner drum.

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8. A method according to any one of the proceeding claims whereby the sifting barrier is a vibrating screen.
9. A method according to claim 8 whereby the vibrating screen is substantially enclosed by a casing and air is extracted from the casing through the vibrating screen to
5 encourage particles under a predetermined size to pass therethrough.
10. A method according to claim 8 or 9 whereby the vibrating screen slopes downwardly on an angle from the horizontal of between 5° and 20°, to encourage the pieces to move over the screen.
11. A method according to any one of the proceeding claims whereby the cartridges
10 are broken up by a shredder.
12. A method according claim 11 whereby the shredder employs twin rollers to break up the cartridges.
13. A method according claim 12 whereby air is extracted from the shredder.
14. A method according to any one of the proceeding claims including the further step
15 of filtering air extracted from adjacent the pieces to remove particles under a predetermined size.
15. A method according to claim 14 whereby the air extracted from adjacent the pieces is passed though a classification column to separate toner powder from impurities.
16. A method according to any one of the proceeding claims including the further step
20 of collecting the cartridge pieces for recycling.
17. A method according to claim 16 including the further step of sorting the cartridge pieces into ferrous metals and non-metals/plastics.
18. An apparatus for extracting toner from toner cartridges including:
a shredder for breaking up toner cartridges into pieces and to thereby
25 release toner from within the cartridges;

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a sifting barrier for sifting the cartridge pieces so that only particles under a predetermined size pass through the barrier;

agitation means to agitate the pieces and mobilise the toner;

an extractor for extracting air from around the sifting barrier to remove
5 airborne particles; and

a toner collector for removing toner from the air extracted by the
extractor.

19. An apparatus according to claim 18 including an ioniser for introducing ionised air into the apparatus.

10 20. An apparatus according to claim 18 or claim 19 wherein the agitating means repeatedly lifts and drops the pieces.

21. An apparatus according to any one of claims 18 to 20 wherein the agitating means is a trommel.

22. An apparatus according to claim 21 wherein the trommel includes an inner drum
15 adapted to rotate about its longitudinal axis and an outer cover, the inner drum having a plurality of apertures and functioning as a separation screen so that only particles under a predetermined size pass through the screen and into the outer cover.

23. An apparatus according to claim 22 wherein the extractor extracts air from within the outer cover to encourage particles under a predetermined size to pass through the
20 apertures in the inner drum.

24. An apparatus according to any one claims 18 to 23 wherein the sifting barrier is a vibrating screen.

25. An apparatus according to claim 24 wherein the vibrating screen is substantially enclosed by a casing and the extractor extracts air from the casing through the vibrating
25 screen to encourage particles under a predetermined size to pass therethrough.

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26. An apparatus according to claim 24 or 26 wherein the vibrating screen slopes downwardly on an angle from the horizontal of between 5° and 20°, to encourage the pieces to move over the screen.
27. An apparatus according to any one of claims 18 to 26 the shredder employs twin
5 rollers to break up the cartridges.
28. An apparatus according claim 27 wherein the extractor extracts air from the shredder.
29. An apparatus according to any one of claims 18 to 28 including a classification column to separate toner powder from impurities.
- 10 30. An apparatus according to any one of claims 18 to 29 including the further step of collecting the cartridge pieces for recycling.
31. An apparatus according to claim 30 including a magnetic separator for sorting the cartridge pieces into ferrous metals and non-metals/plastics.